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ABSTRACT

This report provides analysis and discussion of the 1996 Rhode Island State Assessment Program performance for grade 4 in mathematics, writing, and health education. It addresses the effects of accommodations and the inclusion of all students in these state assessments, examining some of the characteristics of tests administered to students with disabilities. The study found that approximately 95 percent of students with disabilities participated in the assessments; that the most commonly used accommodations for students receiving special education services were oral presentation, resource room setting, and repeated directions; that there was no evidence that use of accommodations resulted in an unfair advantage; that extended time was the most used accommodation by all students, and this accommodation resulted in higher performance than any other accommodation; and that students with disabilities consistently performed lower than peers without disabilities. (DB)

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STATE ASSESSMENT SERIES
Rhode Island Report 1

Accommodations and the Performance of All Students on Rhode Island's Performance Assessment

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Accommodations and the Performance of All Students on Rhode Island's Performance Assessment

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Overview

Over the past few years, education assessments and accountability systems have gained increased attention as means for evaluating how well schools are teaching students and how well students are learning. Although assessments have been the primary means to evaluate school and student progress, all students have not been included in them. Students with special needs, in fact, have been excluded to a great extent from accountability systems and state and/or district assessments (Erickson, Thurlow, & Thor, 1995; McGrew, Thurlow, Shriner, & Spiegel, 1992; Thurlow, Elliott, & Ysseldyke, 1998)

The 1997 passage of amendments to the Individuals with Disabilities Education Act (IDEA) sought to change this assessment practice. In order to continue to receive federal special education funds, states are required to include all students with disabilities in their regular assessments, with accommodations where needed. In addition, states must report the number and percentage of students participating in the regular assessment and the performance of these students in the same way and with the same frequency as reported for other students. Finally, by July 1, 2000 all states must have in place an alternate assessment system for those students who are unable to participate in the regular assessments, even with accommodations.

The dramatic changes in IDEA requirements were due, in part, to the lack of data on how students with disabilities are doing in the general curriculum and against the education standards set for all students. Past practice of high rates of exclusion of students with disabilities from assessments, in turn, forced their absence from accountability reports and in many ways perpetuated a dual system of education. The reauthorized IDEA has placed greater emphasis on the access of students with disabilities to the general education curriculum and their participation in it, and in the district and state assessments that drive the curriculum.

Despite the pervasive exclusion of students with disabilities from assessments and accountability systems in the past, there are a few states that have made significant efforts to include all students, including students with disabilities. One of these states is Rhode Island.

Rhode Island State Assessment Program

Rhode Island is one of the first states in the country to allow *all* students the use of assessment accommodations for statewide assessments. This policy change was precipitated by key actions taken by the state's Board of Education.

In Spring 1992, the Rhode Island State Board of Regents for Elementary and Secondary Education formally adopted an "ALL KIDS" agenda as the guiding vision for statewide education decision

making. It also directed the State Department of Elementary and Secondary Education to redesign the State Assessment Program to de-emphasize norm-referenced, multiple-choice testing instruments; to emphasize performance-based assessment measures; and to implement assessment instruments that emphasize higher order thinking skills. The existing State Assessment Program had been in place for more than a decade, consisting of a norm-referenced basic skills instrument, a writing assessment, and a multiple choice health education assessment.

Performance Assessments

As the development of new state performance assessments progressed during 1993 and 1994, this work became increasingly coupled with the concurrent development of new state curriculum frameworks that emphasize high standards for all students. In Rhode Island, as nationally, the demands on the State Assessment Program to inform and improve instruction and to provide clear and accurate measures of student progress toward achieving standards intensified greatly. Not only did the assessments need to be aligned with the framework content standards, but they also needed to provide opportunity for all students to demonstrate what they know and are able to do in keeping with the ALL KIDS vision.

Performance assessments are not constrained by norming conditions for valid score inference in the way that norm-referenced tests are. The performance assessments developed or selected for use in Rhode Island intentionally sought to elicit a variety of constructed response approaches, and also to provide for the possibility of multiple correct or reasonable responses, and for partial credit (rubric scoring). Any students who participate in these performance assessments can demonstrate the extent to which they understand and can apply the knowledge, skills, concepts, and processes being assessed. The results of these performance assessments are good indicators of how well students are achieving the standards identified as important to their future success. Thus, a new challenge for the State Assessment Program became that of providing access for all students to these performance assessments so that students have the opportunity to show what they know without impediment of their disability or English language status. This challenge arose because, in Rhode Island as elsewhere, there were students either who were being excluded from the State Assessment Program or whose scores were not included in the school reports. Typically, those excluded were students with disabilities who received special education services more than fifty percent of the day and English language learners who had been in the United States less than two years.

Participation by All Students

All field testing of the new Rhode Island performance assessments, beginning with Mathematics and Health Education in Grade 4, needed to reflect the impact of full participation so that

decisions about test construction for the State Assessment Program could be based on valid information. In laying the ground work for increasing the participation of students with disabilities and those who are English language learners, the Rhode Island Department of Education arranged for a statewide conference in conjunction with a meeting of the Northeast Region, and then for on-going technical assistance from the Northeast Regional Resource Center (NERRC) and the National Center on Educational Outcomes (NCEO). One immediate result of this assistance was the formation of an advisory committee to work with the Department of Education on issues related to the development and implementation of a full participation policy for the new performance assessments. Initial goals included raising awareness statewide, suggesting and reacting to policy and implementation issues, and assisting in the development of the first guidelines and accommodations suggestions for schools to consider in implementing full participation for the field test.

Continuing work for this group has focused on expanding awareness, reviewing what occurred relative to participation in the statewide testing, providing input from schools and districts on what is or is not working effectively with regard to policies and guidelines, and creating additional or revised materials for possible inclusion in future policies and guidelines. This advisory group is comprised of school and district administrators—including central office, special education directors, limited English proficient program directors, Chapter 1 directors, principals, and testing coordinators; teachers—including general education, content specialists, special education, and limited English proficient (LEP); Department of Education staff—including Office of Special Needs, Office of Assessment, and LEP program specialists. NERRC and NCEO have provided on-going technical assistance and consultation support, periodically attending or facilitating meetings.

Spring 1995 Mathematics and Health Education Field Tests

In Spring 1995 Mathematics and Health Education performance assessments were field tested at Grade 4 statewide in a substantial sample of schools. This was the first time assessment accommodations were allowed for all students in the State Assessment Program. Teachers, in consultation with school and district staff, were asked to determine from a list of possible accommodations those that were being used in typical instructional situations with particular students. Those that were congruent with the testing purposes and would not invalidate the scores could be selected for use during the field tests. Any student who was using accommodations regularly during instruction, not just those with Individualized Educational Programs (IEPs) or in LEP programs, could use them also during the field tests.

During the field test, 5,582 Grade 4 students participated; 13% were special education students and 7% were in LEP programs. Of the 13% who had IEPs, 53% received one or more

accommodations, 47% did not. The three most common accommodations used on the field tests were oral reading of directions and questions, interpretations of directions, and repeating the directions. As a result of allowing accommodations, much higher percentages of students enrolled in the schools in the sample were included in the 1995 field testing than had ever participated in Rhode Island's State Assessment Program in the past.

Supporting Education Reform in Rhode Island

To support the continued redesign of the State Assessment Program, the Department of Education issued in 1995 a Request For Proposals (RFP) whose goals were to facilitate planning, development, technical support, and implementation of the new performance assessments and all related aspects, and continued similar support for the Writing assessments. One component of the RFP sought technical assistance with regard to increasing the participation of special needs and LEP students in the State Assessment Program. NCEO served as a subcontractor to Harcourt Brace Educational Measurement, the testing company that was selected to work with the Rhode Island State Assessment Program, for the next three-year contract cycle.

Although the reauthorization of Improving America's Schools Act (IASA) in 1996 requires the public reporting of assessment results in a meaningful and disaggregated way for program participation, the State Board of Regents had already expanded in 1994 the publicly reported state assessment results to include disaggregations for minority students, special education students, and LEP students. This step was taken in support of the ALL KIDS vision to help schools demonstrate accountability and continuous improvement for all of their students. Also in 1996, the Rhode Island Goals 2000 panel issued its report, which was then adopted by the Board of Regents. This report, Rhode Island's Comprehensive Education Strategy—All Kids, All Schools, defines broad goals for education and includes some details and next steps. Thus, there were many key policy changes between 1992 and 1996. Major education reform legislation passed in 1997; it incorporated and expanded on these policies and instituted school accountability for the Comprehensive Education Strategy. This law includes sections requiring:

- Statewide performance assessments in core areas
- Standards-based school performance reports
- The public reporting of these school assessment results with disaggregations for poverty status, gender, race/ethnicity, LEP program participation, and special education program participation
- Schools to set targets for improved student performance on the state assessments
- Progressive support and intervention for schools that do not demonstrate improved assessment results

Overall, Rhode Island has approached education reform through public reporting for school accountability by (1) setting high standards for what students should know and be able to do, (2) measuring student performance with assessments that show how well students are doing toward achieving the standards, and (3) strengthening teaching and learning through school improvement involving the whole school community.

Spring 1996 State Assessment Program

In Spring 1996, the new performance assessments in Mathematics and Health Education at Grade 4, Writing at grades 4, 8, and 10, and a field test for grade 8 Health Education were administered. At that time, it was expected that all students would participate in these performance assessments. Teachers and IEP teams working with any students who had modified education programs were encouraged to complete an Assessment Accommodation Worksheet for each of these students in order to determine whether one or more assessment accommodations should be provided and which one(s). The target groups included students with IEPs and Section 504 plans, and those receiving LEP or Title I or Classroom Alternatives Process/Classroom Alternative Support Team (CAP/CAST) services, but students without formal plans and those not in special programs were also eligible to receive assessment accommodations. For each student tested, information was also collected on demographics, which accommodations were provided, and whether the student was served by special programs (e.g., special education, LEP, Title I, etc.)

This report provides analyses and discussion of the findings of the 1996 Rhode Island State Assessment Program performance for Grade 4 assessment in Mathematics, Writing, and Health Education. It addresses the effects of accommodations and the inclusion of all students in these state assessments, as well as examining some of the technical characteristics of tests when administered to students with disabilities.

Method

In Spring of 1996 Rhode Island administered new performance assessments in Grade 4 Mathematics, Writing, and Health Education. Table 1 provides the number of students assessed. Special program categories are presented for Special Education Students: Services less than 50% of the day, and Services at least 50% of the day.

Table 1. Participation of Students with Disabilities in 1996 Performance Assessments (Math, Writing, and Health)

	Without Accommodations	With Accommodations	Total Tested	Not Tested	Total Accounted for
Mathematics, Gr 4			11,341 (96.5%)	203 (1.7%)	11,747
Special Education Services < 50%	613	338	951 (98.6%)	13 (1.3%)	964
Special Education Services > 50%	93	251	344 (95.3%)	17 (4.7%)	361
Writing, Gr 4			11,429 (97.3%)	238 (2.0%)	11,747
Special Education Services < 50%	678	236	914 (98.7%)	12 (1.3%)	926
Special Education Services > 50%	139	211	350 (85.8%)	58 (14.2%)	408
Health, Education Gr 4 *			11,273 (96.0%)	255 (2.2%)	11,747
Special Education Services < 50%	629	306	935 (97.2%)	27 (2.8%)	962
Special Education Services > 50%	108	245	353 (95.4%)	17 (4.6%)	370

* Parents may opt to remove students from health instruction and assessment.

Results

Results for the Grade 4 Mathematics, Writing, and Health Education performance assessments are provided here. For each content area, data are provided on numbers of students in the assessment using accommodations and the performance of students using various accommodations. In addition, the results of technical adequacy analyses are presented, including analyses of internal consistency, factor structures, and correlations involving the reading and math subtests of the Metropolitan Achievement Test (MAT).

Mathematics

A total of 11,341 students' test scores were analyzed for the Mathematics performance assessment. Of the 11,341 students, 12.5% (n = 1,295) were receiving special education services at the time they participated in the assessment. Of the students in special education, 73.4% (n = 951) received special education services less than 50% of the school day, and 26.6% (n = 344) received special education services more than 50% of the school day.

Use of Accommodations

Table 2 gives a summary of the percentages of students taking the Mathematics assessment with and without accommodations. As is evident in this table, a greater percentage of students receiving special education services than students not in special education used accommodations (approximately 53% of special education students, compared to 10% of non special education students). Of the special education students, those receiving services for more than 50% of the day were much more likely to use accommodations (75.0%) than those receiving services for less than 50% of the day (36.4%).

The specific accommodations used most often by the 1,564 students who used them during the Mathematics assessment are shown in Table 3. Comparing the students receiving special education services and those not in special education reveals that those not in special education are more likely to use extended time as an accommodation than they are to use any of the others (approximately 59% of these accommodated students used extended time; the next most frequently used accommodation was oral presentation, which was used by about 37% of the students not in special education).

In contrast, the accommodation used most frequently by students receiving special education services was having the assessment presented orally; about 68% of the accommodated students used this accommodation. Unlike for non special education students, there were at least two other frequently used accommodations, ones used by at least 50% of the students in special

Table 2. Use of Accommodations During Mathematics Assessment

Testing Condition	Students Not in Special Education	Students in Special Education	Special Education Services < 50%	Special Education Services > 50%
Without Accommodations	90.5% (n = 9095)	58.8% (n = 691)	63.6% (n = 605)	25.0% (n = 86)
With Accommodations	9.5% (n = 960)	53.0% (n = 604)	36.4% (n = 346)	75.0% (n = 258)

Table 3. Most Frequently Used Accommodations During Mathematics Assessment

Accommodation Used	Students Not in Special Education (n = 960)	Students in Special Education (n = 604)	Special Education Services < 50% (n = 346)	Special Education Services > 50% (n = 258)
Extended Time	59.2% (n = 568)	33.8% (n = 204)	37.3% (n = 129)	29.1% (n = 75)
Oral Presentation	36.8% (n = 353)	68.4% (n = 413)	59.5% (n = 206)	80.2% (n = 207)
Oral Response	1.7% (n = 16)	17.2% (n = 104)	9.8% (n = 34)	27.1% (n = 70)
Repeated Directions	29.2% (n = 280)	61.2% (n = 370)	55.2% (n = 191)	69.4% (n = 179)
Resource Room Testing	3.2% (n = 31)	53.5% (n = 323)	46.2% (n = 160)	63.2% (n = 163)
Small Group Testing	10.0% (n = 96)	34.8% (n = 210)	34.5% (n = 121)	34.5% (n = 89)

education who used accommodations; about 61% had directions repeated, and about 54% were tested in a resource room. In contrast to the 59% of students not in special education using extended time as an accommodation, only 34% of students in special education used extended time.

The accommodations used by students receiving special education services less than 50% of the day (see Table 3) were similar to those used by special education students overall. In contrast, the accommodations used by students receiving special education services for more than 50% of the day showed more use of oral presentation and oral response, and much less use of extended time. The largest differences in percentages of students using particular accommodations for the two groups were for oral response (9.8% vs. 27.1%) and oral presentation (59.5% vs. 80.2%).

While Table 3 indicates the number of students receiving each accommodation, it does not give any indication of the number of accommodations that individual students used. In other words, a student who received an oral presentation of the assessment might also have used extended time, and might have taken the assessment in a resource room. Table 4 provides information on the number of accommodations used by those students who used accommodations.

The differences in patterns for students in special education and students not in special education are quite evident in this table, with the great majority (64%) of those students not in special

Table 4. Number of Accommodations Used by Students in the Mathematics Assessment

Number of Accommodations	Students Not in Special Education	Students in Special Education	Special Education Services < 50%	Special Education Services > 50%
1	64.4% (n = 618)	20.7% (n = 125)	27.2% (n = 94)	12.0% (n = 31)
2	20.3% (n = 195)	20.0% (n = 121)	22.8% (n = 79)	16.3% (n = 42)
3	8.5% (n = 82)	20.5% (n = 124)	22.0% (n = 76)	18.6% (n = 48)
4	4.3% (n = 41)	17.9% (n = 108)	16.5% (n = 57)	19.8% (n = 51)
5	1.4% (n = 13)	11.6% (n = 70)	8.7% (n = 30)	15.5% (n = 40)
6	1.1% (n = 11)	9.3% (n = 56)	2.9% (n = 10)	17.8% (n = 46)

education using just one accommodation. In contrast, students in special education were more likely to use more accommodations, with from one to four accommodations being used by about 20% each, and approximately 10% of the students using five or six accommodations. When the students in special education are broken down by the percentage of time in special education, the patterns are slightly different, with those receiving services less than 50% of the day tending to use one to three accommodations, and those receiving services more than 50% of the day tending most often to use two or more accommodations.

Performance

The average mathematics scores of students are presented in Table 5. In this table, the scores of general education and special education students are presented according to whether the student used none, one, or two or more accommodations. Statistical tests revealed significant differences among groups, $F(5, 11344) = 177.14$, $F < .0001$. Tukey Honestly Significant Difference (HSD) follow-up tests indicated that general education students who received no accommodation or one accommodation performed at significantly higher levels than students in any other group, and that students in special education who received no accommodations performed significantly higher than the lowest scoring group of students (students not in special education who used two or more accommodations).

Table 5. Math Performance of Students Using None, One, or Two or More Accommodations

Number of Accommodations		Students Not in Special Education	Students in Special Education
None	Mean	14.77[a]	10.84[b]
	SD	5.95	5.42
	n	9095	691
One Accommodation	Mean	13.30	10.20
	SD	6.75	5.91
	n	618	125
Two or More Accommodations	Mean	9.01	9.85
	SD	4.79	5.81
	n	342	479

[a] Mean score was significantly higher than the mean scores of the one accommodation and two or more accommodations groups.
[b] Mean score was significantly higher than the mean score of the two or more accommodations group.

About 30 different accommodations and combinations of accommodations were used during the mathematics performance assessment. However, the number of students in each combination often was very small, too small to warrant analysis. To facilitate analyses, the most frequently used accommodations and combinations of accommodations were identified. These were:

- Timing accommodations
- Oral presentation
- Oral presentation/Repeated directions/Setting
- Oral presentation/Repeated directions/Response/Setting
- Other combinations of accommodations

Test performance information for each accommodation/combination is shown in Table 6. In this table, the performance of students in special education is displayed according to the percentage of time receiving special education services. Several patterns are evident. For students not in special education, significant differences were found among the various accommodations/ combinations, F (6,10048) = 82.28, $p < .0001$. Follow-up Tukey HSD indicated that average performance is highest in the Timing accommodation and the No accommodations conditions. In fact, these conditions produced performance levels that were significantly higher than those in any other accommodation or combination of accommodations.

The findings were different for students in special education, where the only statistically significant differences were found for students receiving services more than 50% of the day,

Table 6. Mathematics Performance of Students Using Various Accommodations

Accommodation		Students Not in Special Education	Special Education Services < 50%	Special Education Services > 50%
Oral Presentation	Mean	7.91	9.10	11.09[c]
	SD	4.74	4.80	7.01
	n	81	10	11
Oral/Repeated Directions	Mean	7.41	9.92	3.67
	SD	3.88	6.27	2.99
	n	93	26	15
Oral/Repeated/ Response/Setting	Mean	10.84	12.11	7.67
	SD	4.90	5.03	4.77
	n	25	44	57
Oral/Repeated/ Setting	Mean	9.64	11.19	6.78
	SD	5.11	4.95	4.77
	n	22	48	69
Other Combinations of Accommodations	Mean	9.93[a]	11.63	8.93[c]
	SD	5.45	5.80	6.06
	n	348	184	101
Timing	Mean	15.43[b]	11.91	*
	SD	6.38	6.11	*
	n	391	34	5
No Accommodations	Mean	14.77[b]	11.27	7.86
	SD	5.95	5.36	4.84
	n	9095	605	86

[a] For the students not in special education, the Other Combinations of Accommodations group had a higher mean performance than the Oral Presentation and the Oral Presentation/Repeated Directions groups.
[b] For the students not in special education, the Timing and No Accommodations groups had higher mean performances than all other groups.
[c] For the students in special education > 50%, the Oral Presentation and Other Combinations of Accommodations groups had higher mean performances than the Oral Presentation/Repeated Directions group.
* These data are not presented because of the small number of students in the group.

F (6,337) = 3.61, $p < .01$. Then, according to Tukey HSD, the differences were for the Oral presentation and Other Combinations of Accommodations groups compared to only the Oral presentation/Repeated directions group. No differences were found for the group of students receiving services for less than 50% of the day, F (6,944) = .89.

Regardless of the accommodation, the performance of the students in special education never

reached the same level as the performance of general education students using no accommodations. There were several instances, however, when the performance of students using accommodations was higher than the performance of students without disabilities using the same accommodations (e.g., oral presentation, oral/repeated directions, oral/repeated/setting, oral/repeated/response/setting). This was more often true for the students in special education less than 50% of the school day than for those students in special education for more than 50% of the day. Only when the accommodation was oral presentation did students receiving special education for more than 50% of the day achieve a higher average score than the other two groups.

Technical Adequacy Measures

Three analyses were conducted on the technical adequacy of the assessment when accommodations were used. First internal consistency reliability coefficient alphas were calculated for each accommodation group. Almost all were considered to be high (.85 to .90 range) or moderate (.75 to .85): Oral presentation = .77 (n = 63), Other accommodations = .81 (n = 502), Timing = .81 (n = 382), Oral/repeated = .78 (n = 94), Oral/repeated/setting = .80 (n = 118), Oral/repeated/response/setting = .72 (n = 109). These are comparable to the coefficient alpha obtained for the No accommodations group (.80; n = 8933).

Second, factor analytic procedures were used to examine the factor structure when accommodations were used, compared to the factor structure when no accommodations were used. To evaluate the relative agreement between the factor structure for the no accommodations group and the remaining groups that had approximately 100 students or more, the correlations using factor loadings were calculated. Correlations greater than .70 indicate an acceptable level of agreement, and thus a similar factor structure. The calculated correlations were:

No accommodations with Oral presentation = .38

No accommodations with Oral/Repeated directions = .37

No accommodations with Oral/Repeated/Setting = .73

No accommodations with Oral/Repeated/Response/Setting = .55

No accommodations with Timing = .95

It is evident that while the Timing and the Oral/Repeated/Setting accommodations correlations were high (indicating similar factor structures), the correlations between no accommodations and the other accommodations were generally quite low. This finding may indicate that the underlying construct being measured is not the same for the accommodated and

nonaccommodated conditions, or it might reflect an interaction with the non-equal numbers of students with disabilities in the group.

Finally, correlations were calculated between scores on the Mathematics performance test and the Metropolitan Achievement Test (MAT) Mathematics Problem Solving and Reading Comprehension subtests. These correlations, which are presented in Table 7, ranged from .25 (Oral presentation/repeated directions/setting with MAT Reading) to .72 (Timing with MAT Mathematics). The correlations for students receiving no accommodations were .60 (with MAT Reading) and .70 (with MAT Math). The correlations for students receiving any accommodations were .61 (with MAT Reading) and .71 (with MAT Math).

Writing

We analyzed 11,373 students' test scores for the Grade 4 Writing assessment. (Data from other grades were not analyzed.) Although 11,429 students were reported to have taken the Grade 4 Writing test (Table 1), data tapes contained data for only 11,373 students. Of the 11,373 Grade 4 students, 11.0% (n = 1249) were receiving special education services when they participated in the assessment. Of the students in special education, 72.4% (n = 904) received special education services less than 50% of the school day and 27.6% (n = 345) received special education services more than 50% of the school day.

Table 7. Mathematic Performance Correlations with MAT Reading and MAT Mathematics Scores

Group	Number	MAT Reading	MAT Math
Oral Presentation	53	.39	.57
Oral/Repeated Directions	76	.52	.60
Oral/Repeated/Response/Setting	47	.25	.64
Oral/Repeated/Setting	46	.26	.63
Other Combinations	316	.49	.60
Timing	308	.63	.72
No Accommodations	7365	.60	.70
All Accommodation Groups	846	.61	.71

Use of Accommodations

Table 8 is a summary of the percentages of students taking the writing assessment with and without accommodations during the assessment. As is evident in this table, a greater percentage of students receiving special education services than students not in special education used accommodations (approximately 35% of special education students, compared to 3% of non special education students). Special education students receiving services for more than 50% of the day were much more likely to use accommodations (60.6%) than those receiving services for less than 50% of the day (25.1%).

The specific accommodations used most often by the 730 students who used them during the Writing assessment are shown in Table 9. Comparing the students receiving special education services and those not in special education reveals that those accommodated students not in special education were most likely to have directions repeated, followed closely by extended time, small group testing, and oral presentation. Students in special education most often used resource room testing and repeated directions, followed by small group testing and oral presentation.

The accommodations used by students receiving special education services less than 50% of the day (see Table 9) were similar to those used by special education students overall. For those students receiving services for more than 50% of the day, there was much greater use of more frequent breaks and oral presentations. The largest differences in percentages of special education students using a particular accommodation for the two groups involved these same accommodations (more frequent breaks: 12.3% vs. 28.7%; oral presentation: 35.2% vs. 60.8%).

An indication of the number of accommodations that individual students used is presented in Table 10, which gives percentages based only on those students using accommodations. The differences in patterns for students in special education and students not in special education are quite evident in this table, with the majority (53.1%) of those students not in special education using just one accommodation. In contrast, students in special education were more likely to

Table 8. Use of Accommodations During Writing Assessment

Testing Condition	Students Not in Special Education	Students in Special Education	Special Education Services < 50%	Special Education Services > 50%
Without Accommodations	97.1% (n = 9830)	65.1% (n = 813)	74.9% (n = 677)	39.4% (n = 136)
With Accommodations	2.9% (n = 294)	34.9% (n = 436)	25.1% (n = 227)	60.6% (n = 209)

Table 9. Most Frequently Used Accommodations During Writing Assessment

Accommodation Used	Students Not in Special Education (n = 585)	Students in Special Education (n = 436)	Special Education Services < 50% (n = 227)	Special Education Services > 50% (n = 209)
Extended Time	38.4% (n = 113)	40.4% (n = 176)	47.1% (n = 107)	33.0% (n = 69)
More Frequent Breaks	6.8% (n = 20)	20.2% (n = 88)	12.3% (n = 28)	28.7% (n = 60)
Oral Presentation	26.5% (n = 78)	47.5% (n = 207)	35.2% (n = 80)	60.8% (n = 127)
Repeated Directions	47.6% (n = 140)	65.1% (n = 284)	58.1% (n = 132)	72.7% (n = 152)
Resource Room Testing	8.8% (n = 26)	65.6% (n = 286)	63.9% (n = 145)	67.9% (n = 142)
Small Group Testing	30.0% (n = 87)	47.7% (n = 208)	51.5% (n = 117)	43.5% (n = 91)

use more accommodations, with from one to three being used by about 20% each, and approximately 14% using four to six accommodations.

Differences in the patterns of number of accommodations used by students receiving services for less than 50% of the day and students receiving services for more than 50% of the day are not clear. The main difference is that those receiving services less than 50% of the day were more often using from one to four accommodations, while those receiving services more than 50% of the day are more spread across all numbers of accommodations, although not necessarily evenly.

Performance

The average writing scores of students are presented in Table 11. In this table, the scores of general education and special education students are presented according to whether the student used none, one, or two or more accommodations. Statistical tests revealed significant differences among groups, F (5, 11367) = 202.11, $p < .0001$. Tukey HSD follow-up tests indicated that general education students who used no accommodations scored significantly higher than all other groups. Students in special education who received accommodations scored significantly lower than all other groups. Students not in special education scored higher than students in

Table 10. Number of Accommodations Used by Students in the Writing Assessment

Number of Accommodations	Students Not in Special Education	Students in Special Education	Special Education Services < 50%	Special Education Services > 50%
1	53.1% (n = 156)	16.0% (n = 70)	17.6% (n = 40)	14.4% (n = 30)
2	10.9% (n = 32)	23.8% (n = 104)	26.0% (n = 59)	21.5% (n = 45)
3	16.0% (n = 47)	17.2% (n = 75)	19.4% (n = 44)	14.8% (n = 31)
4	12.6% (n = 37)	14.4% (n = 63)	18.1% (n = 41)	10.5% (n = 22)
5	3.1% (n = 9)	14.7% (n = 64)	10.6% (n = 24)	19.1% (n = 40)
6	4.1% (n = 13)	13.8% (n = 60)	8.4% (n = 19)	19.6% (n = 41)

Table 11. Writing Performance of Students Using None, One, or Two or More Accommodations

Number of Accommodations		Students Not in Special Education	Students in Special Education
None	Mean	7.26[a]	6.07
	SD	1.69	1.62
	n	9830	813
One Accommodation	Mean	6.45	5.13[b]
	SD	1.69	1.68
	n	156	70
Two or More Accommodations	Mean	6.17	5.21[b]
	SD	1.61	1.72
	n	138	366

[a] Mean score was significantly higher than scores of all other groups.
[b] Mean scores for special education students using accommodations was significantly lower than scores of all other groups.

special education, regardless of the number of accommodations used. Both students in special education and students not in special education earned higher scores if they did not use accommodations.

About 25 different accommodations and combinations of accommodations were used during the Writing assessment. However, the number of students in each combination often was very small, too small to warrant analysis. To facilitate analyses, the most frequently used accommodations and combinations of accommodations were identified:

- Timing accommodations
- Repeated directions
- Oral presentation
- Oral presentation/Repeated directions/Setting
- Oral presentation/Repeated directions/Setting/Timing
- Repeated Directions/Setting
- Repeated Directions/Setting/Timing
- Other combinations of accommodations

Test performance information for each accommodation/combination is shown in Table 12, according to the percentage of time receiving special education service.

Caution must be observed in interpreting some of the scores in Table 12 because of the small numbers of students. Statistical tests revealed significant differences only for students not in special education, F (8, 10115), $p < .0001$, and for students receiving special education services for more than 50% of the day, F (8, 336) = 3.86, $p < .0001$. Overall, according to Tukey HSD follow-up tests, general education students who did not use accommodations earned higher scores than students who used timing accommodations, oral presentation, and other accommodations. For students in special education receiving services for more than 50% of the day, Tukey HSD follow-up tests indicated that those who did not use accommodations earned significantly higher scores than students using the repeated directions/setting combination of accommodations or the timing accommodation.

Technicai Adequacy Measure

For the Writing assessment, technical adequacy was examined by calculating correlations between scores on the Writing assessment with scores on the Metropolitan Achievement Test (Mathematics Problem Solving and Reading Comprehension subtests). These are presented in Table 13.

The correlations ranged from .00 (Oral presentation with MAT Mathematics) to .53 (Repeated directions/Setting with MAT Reading). The correlations of students using no accommodations were .40 (with MAT Reading) and .35 (with MAT Mathematics). The correlations for students using any accommodations were .35 and .29.

Table 12. Writing Performance of Students Using Various Accommodations

Accommodation		Students Not in Special Education	Special Education Services < 50%	Special Education Services > 50%
Oral Presentation	Mean	5.85	*	*
	SD	1.52	*	*
	n	33	4	5
Oral/Repeated/ Setting/	Mean	*	5.43	4.25
	SD	*	1.45	1.77
	n	8	14	20
Oral/Repeated/ Setting/Timing	Mean	*	6.00	4.66
	SD	*	1.33	1.54
	n	8	27	44
Other Combinations of Accommodations	Mean	6.23	5.94	4.79
	SD	1.89	1.60	1.78
	n	139	86	80
Repeated Directions	Mean	6.86	5.70	*
	SD	1.46	1.34	*
	n	49	10	6
Repeated/Setting	Mean	6.30	5.39	3.87
	SD	1.25	1.46	1.58
	n	10	18	23
Repeated/Setting/ Timing	Mean	6.45	5.96	*
	SD	1.47	1.46	*
	n	22	25	3
Timing	Mean	6.20	6.07	3.86
	SD	1.22	1.39	1.18
	n	25	43	28
No Accommodations	Mean	7.26[a]	6.27	5.07[b]
	SD	1.69	1.56	1.55
	n	9830	677	136

[a] Mean score was significantly higher than scores of general education students using timing accommodations, oral presentation, and other accommodations.

[b] Mean score was significantly higher than scores of special education students receiving services more than 50% of the day who used repeated directions/setting or timing accommodations.

* The data are not presented because of the small number of students in the group

Table 13. Writing Performance Correlations with MAT Reading and Mathematics Scores

Group	Number	MAT Reading	MAT Math
Oral Presentation	25	.18	.00
Oral/Repeated/Setting	13	.18	.39
Oral/Repeated/Setting/Timing	23	.20	.15
Other Combinations	119	.37	.30
Repeated Directions	35	.34	.21
Repeated/Setting	25	.53	.42
Repeated/Setting/Timing	35	.32	.22
Timing	23	.20	.15
No Accommodations	8131	.40	.35
All Accommodation Groups	324	.35	.29

Health

The scores of a total of 11,273 students who took the test were analyzed for the Health Education performance assessment. Although 11,275 students reportedly took the test (Table 1), data tapes provided raw data for a total of 11,273 students. Of the students in special education, 72.6% (n = 936) received special education services less than 50% of the school day and 27.4% (n = 353) received special education services more than 50% of the school day.

Use of Accommodations

Table 14 summarizes the percentages of students taking the Health Education assessment with and without accommodations. As in other assessments, a greater percentage of students receiving special education services than students not in special education used accommodations (approximately 44% of special education students, compared to 6% of non special education students). Of the special education students, those receiving services for more than 50% of the day were much more likely to use accommodations (72%) than those receiving services for less than 50% of the day (34%).

The specific accommodations used most often by the 1,197 students who used them during the

Table 14. Use of Accommodations During Health Assessment

Testing Condition	Students Not in Special Education	Students in Special Education	Special Education Services < 50%	Special Education Services > 50%
Without Accommodations	93.7% (n = 9359)	55.8% (n = 719)	66.2% (n = 620)	28.0% (n = 99)
With Accommodations	6.3% (n = 627)	44.2% (n = 570)	33.8% (n = 316)	72.0% (n = 254)

Health Education assessment are shown in Table 15. Comparing the students receiving special education services and those not in special education reveals that those not in special education were more likely to use oral presentation (approximately 54%); the next most frequently used accommodations were extended time and repeated directions, both representing about 40% of the accommodations used by students not in special education.

Similarly, the accommodation used most frequently by students receiving special education services was oral presentation; about 72% of the accommodated students used this

Table 15. Most Frequently Used Accommodations During Health Assessment

Accommodation Used	Students Not in Special Education (n = 627)	Students in Special Education (n = 570)	Special Education Services < 50% (n = 316)	Special Education Services > 50% (n = 254)
Extended Time	43.7% (n = 274)	25.4% (n = 145)	34.2% (n = 108)	14.6% (n = 37)
Oral Presentation	53.6% (n = 336)	71.6% (n = 408)	63.3% (n = 200)	81.9% (n = 208)
Oral Response	2.4% (n = 15)	18.9% (n = 108)	10.1% (n = 32)	29.9% (n = 76)
Repeated Directions	38.1% (n = 239)	61.8% (n = 352)	55.4% (n = 175)	69.7% (n = 177)
Resource Room Testing	5.3% (n = 33)	61.8% (n = 320)	51.3% (n = 162)	62.2% (n = 158)
Small Group Testing	14.2% (n = 89)	36.0% (n = 205)	37.3% (n = 118)	34.2% (n = 87)

accommodation. Close in percentage of use were repeated directions and resource room testing (each at 61.8%). In contrast to the 54% of students not in special education using oral presentation as an accommodation, approximately 72% of students in special education used oral presentation.

The accommodations used by students receiving special education services less than 50% of the day (see Table 15) were similar to those used by students receiving special education services for more than 50% of the day, except for two of the accommodations: extended time was used by a much smaller percentage of students receiving special education for more than half of the day (15% vs. 34%) and oral response by a much larger percentage (30% vs. 10%).

The number of accommodations used by individual students is presented in Table 16, which gives percentages based only on those students using accommodations. The differences in patterns for students in special education and students not in special education are quite evident in this table, with approximately half (49%) of those accommodated students not in special education using just one accommodation. In contrast, students in special education were likely to use more accommodations with from one to four accommodations being used by about 20% each, and approximately 10% of the students using five or six accommodations.

When considering accommodated students in special education according to the percentage of time they receive special education services, the patterns are slightly different, with those

Table 16. Number of Accommodations Used by Students in Health Assessment

Number of Accommodations	Students Not in Special Education	Students in Special Education	Special Education Services < 50%	Special Education Services > 50%
1	49.4% (n = 310)	16.3% (n = 93)	21.2% (n = 67)	10.2% (n = 26)
2	28.9% (n = 181)	22.4% (n = 128)	24.3% (n = 77)	20.1% (n = 51)
3	10.8% (n = 68)	22.1% (n = 126)	26.9% (n = 85)	16.1% (n = 41)
4	7.3% (n = 46)	18.8% (n = 107)	17.7% (n = 56)	20.1% (n = 51)
5	2.1% (n = 13)	11.6% (n = 66)	7.9% (n = 25)	16.1% (n = 41)
6	1.4% (n = 9)	8.8% (n = 50)	1.9% (n = 6)	17.3% (n = 44)

receiving services less than 50% of the school day tending to use one to four accommodations with nearly equal frequency, and those receiving services more than 50% of the day tending most often to use from two to six accommodations.

Performance

The average Health Education scores of students are presented in Table 17. This table shows the scores of general education and special education students according to whether the students used none, one, or two or more accommodations. Statistical tests revealed significant differences among groups, F (5,11269) = 139.68, $p < .0001$. Follow-up Tukey HSD tests indicated that general education students who received none or one accommodation and special education students who received no accommodations performed at significantly higher levels than students in all other groups. The scores of students in special education were below those of students not in special education, regardless of the number of accommodations used.

About 30 different accommodations and combinations of accommodations were used during the Health Education assessment. However, the number of students in each combination often was very small, too small to warrant analysis. To facilitate analyses, the most frequently used accommodations and combinations of accommodations were identified. These were:

- Timing accommodation
- Oral presentation
- Oral presentation/Repeated directions
- Oral presentation/Repeated directions/Setting

Table 17. Health Performance of Students Using None, One, or Two or More Accommodations

Number of Accommodations		Students Not in Special Education	Students in Special Education
None	Mean	15.82[a]	13.03[a]
	SD	4.85	4.71
	n	9359	719
One Accommodation	Mean	14.36[a]	11.35
	SD	5.82	4.29
	n	310	93
Two or More Accommodations	Mean	12.04	11.99
	SD	4.65	5.08
	n	317	477

[a] Mean scores were significantly higher than scores of all other groups.

- Oral presentation/Repeated directions/Response/Setting
- Other combinations of accommodations

Test performance information for each accommodation/combination is shown in Table 18. In this table, the performance of students in special education is presented according to the percentage of time receiving special education services. Several patterns are evident in this table. For students not in special education, statistical tests revealed significant differences, F (6, 9979) = 43.80, $p < .001$. Follow-up Tukey HSD tests indicated that average performance was highest in the timing accommodation and when no accommodations were used. In fact, these conditions produced performance levels that were significantly higher than those in any other accommodation/combination.

Table 18. Health Education Performance of Students Using Various Accommodations

Accommodation		Students Not in Special Education	Special Education Services < 50%	Special Education Services > 50%
Oral Presentation	Mean	13.01[a]	11.33	10.08
	SD	4.83	3.58	2.07
	n	83	12	12
Oral/Repeated	Mean	10.54	10.06	7.00
	SD	4.75	6.90	4.34
	n	91	17	15
Oral/Repeated/ Response/Setting	Mean	14.27[a]	13.91[a]	10.66
	SD	4.54	4.44	4.79
	n	26	45	56
Oral/Repeated/ Setting/	Mean	12.00	13.11	9.82
	SD	4.20	4.18	5.04
	n	26	47	66
Other Combinations of Accommodations	Mean	12.66[a]	13.20	11.29[a]
	SD	4.84	4.54	5.17
	n	280	178	105
Timing	Mean	16.54[b]	12.94	*
	SD	6.13	4.19	*
	n	121	17	5
No Accommodations	Mean	15.82[b]	13.41[a]	10.65
	SD	4.85	4.48	5.36
	n	9359	620	99

[a]Mean scores were significantly higher than scores of Oral/Repeated group.
[b]Mean scores were significantly higher than all other groups, but not each other.

For students in special education, statistically significant differences also were found: both for those receiving services < 50%, F (6,929) = 2.08, $p < .05$; and for those receiving services > 50%, F (6,346) = 2.24, $p < .05$. Follow-up Tukey HSD tests indicated that for students receiving services < 50%, those receiving no accommodations or the oral/repeated/response/setting combination had performances that were higher than in all other accommodations conditions. It should also be noted that for several of the accommodations/combinations, the performance of students in special education less than 50% of the day was close to the performance of students not in special education. Students receiving services more than 50% of the day consistently performed below all other students in all accommodations conditions.

Technical Adequacy Measures

Three analyses were conducted on the technical adequacy of the Health Education assessment when accommodations were used. First internal consistency reliability coefficient alphas were calculated for each accommodation group. All were considered to be high (.85 to .90+ range): Timing accommodations = .93 (n = 126), Oral/repeated/setting = .91 (n = 127), Oral/repeated/response/setting = .91 (n = 103), Oral presentation = .89 (n =99), Oral presentation/repeated = .92 (n = 108), Other accommodations = .90 (n = 494), No accommodations = .89 (n = 9622).

Second, factor analytic procedures were used to examine the factor structure when accommodations were used, compared to the factor structure when no accommodations were used. To evaluate the relative agreement between the factor structure for the no accommodations group and the remaining groups that had approximately 100 students or more, the correlations using factor loadings were calculated. Correlations greater than .70 indicate an acceptable level of agreement, and thus a similar factor structure. The calculated correlations were:

No accommodations with Oral presentation = .14

No accommodations with Oral/Repeated directions = .45

No accommodations with Oral/Repeated/Setting = .72

No accommodations with Oral/Repeated/Response/Setting = .37

No accommodations with Timing = .89

It is evident that while the Timing and Oral/Repeated/Setting correlations were high (indicating similar factor structures), the correlation between no accommodations and other accommodations was lower, suggesting that the underlying construct being measured might not be the same for the nonaccommodated and accommodated conditions.

Last, correlations were calculated between scores on the Health Education assessment and the Metropolitan Achievement Test (Mathematics Problem Solving and Reading Comprehension

subtests). These correlations, which are presented in Table 19, ranged from .02 (Oral/Repeated/Response/Setting with MAT Math) to .71 (Timing with MAT Mathematics). The correlations for students receiving no accommodations were .46 (with MAT Reading) and .39 (with MAT Mathematics). The correlations for students receiving any accommodations were .53 (with MAT Reading) and .46 (with MAT Mathematics).

Table 19. Health Performance Correlations with MAT Reading and Math Scores

Group	Number	MAT Reading	MAT Math
Oral Presentation	58	.66	.46
Oral/Repeated	66	.49	.54
Oral/Repeated/Response/Setting	47	.07	.02
Oral/Repeated/Setting	48	.29	.06
Other Combinations	261	.41	.34
Timing	96	.63	.71
No Accommodations	7523	.46	.39
All Accommodation Groups	576	.53	.46

Discussion

Accountability for student learning and performance is a key aspect of educational reform at the local school, district, state, and national levels. The use of state-level assessments, particularly, has burgeoned during the past several years. However, many students receiving special education services have been excluded from them for a variety of reasons. One reason is that these students often need assessment accommodations. In the past, students who needed accommodations either were excluded from the assessment or were allowed to take the test but their results did not count. As the Americans with Disabilities Act and other civil rights legislation created the expectation that accommodations would be provided, questions have emerged about their acceptability for *all* individuals who need them.

Rhode Island is one of the few states to have data available from a statewide assessment system

that allows accommodations for all students. During the conceptualization of its assessments, Rhode Island carefully considered how to document its data in a way that would allow for systematic analysis of accommodations used and resulting performance. Because of this, we now have valuable data on the participation of students with and without disabilities, their use of accommodations, and their performance in the areas of mathematics, writing, and health.

In general, participation rates were high, with approximately 95% of students with disabilities participating in the assessments. Slight variations existed as a function of percentage of time receiving special education services—generally, the percentage tested was higher for those students receiving services less than 50% of the day. Also, participation tended to be higher at the lower grade levels. Holding grade constant (i.e., looking only at Grade 4), participation rates seemed to be quite consistent across content areas.

With regard to the use of accommodations, students in special education used accommodations much more than those students not in special education. Similarly, students receiving special education services for more than 50% of the day used accommodations more than those receiving services less than 50% of the day.

The most commonly used accommodations by students not in special education were extended time and oral presentation, followed by repeated directions. This was consistent across the three areas assessed (Math, Writing, and Health). Students receiving special education services most commonly used oral presentation, resource room, and repeated directions. These findings were fairly consistent regardless of the amount of time the students were receiving special education. The few exceptions to these general findings were that for Writing, students receiving special education services more than 50% of the day used more frequent breaks during testing than students receiving services less than 50% of the day. In contrast, for Health, students receiving special education services less than 50% of the day used extended time more than students receiving services more than 50% of the day.

Rhode Island's State Assessment Program allows all students to use as many accommodations as needed on the performance assessment. The number of assessment accommodations requested by the majority of students not receiving special education services was one, whereas students receiving special education services averaged one to three. These results suggest that there may be no reason to not allow *all* students to use needed accommodations. Current concerns about the use of assessment accommodations focus on the unfair advantage they may create, score inflation, or comparability of test scores. The results of this study provide needed evidence relevant to these concerns. In this analysis, general education students who used no accommodations, or just one accommodation, scored significantly higher than all other students. Students receiving special education services scored lower, regardless of the number of accommodations used, than students not in special education who used no accommodations.

Interestingly, the Writing assessment showed both special education and general education students who did not use any accommodations scoring significantly higher than students in all other accommodation conditions. While there were a few differences in specific findings within content areas, in general the findings showed that accommodations did not inflate test scores.

In contrast to the expected inflation of test scores, it was often the case that students *not* using accommodations, whether special education or general education, scored significantly higher than students who did use accommodations. This suggests that additional factors may interact with the use of accommodations. Some practices have suggested that the perception of a student's level of performance drives the provision of accommodations. Those students expected to perform least well may be given more accommodations, perhaps under the mistaken belief that the accommodations will increase their scores. Of course, it also may be true that these students' scores are increased as a result of having the accommodations that they need. We cannot tell which is more likely the case without a research design that is more experimental in nature (see McGrew, Thurlow, Ysseldyke, Tindal, Thompson, & Elliott, 1998). Finally, it is important to examine the use of accommodations during the instructional process. For example, are they provided for instruction and classroom tests or have students first used them on the district/statewide assessments?

Generally, extended time was the most used accommodation by all students participating in the assessment. This accommodation did, in fact, show performance levels that were higher than those in other accommodation conditions. Perhaps the mere presence of no time constraint lowers the anxiety of the test taker, allowing students to be relaxed and thoughtful in their work.

The finding that students with disabilities perform lower than their peers without disabilities deserves continued study. Research needs to extend beyond observation of assessment results to study reasons for performance discrepancy. That is, do students with disabilities actively involved in standards-based reform perform at the same or higher levels than those students who have not been a part of reform efforts? Do students with disabilities have access to the complete general education curriculum? It is particularly important to begin to look at changes in performance over time, and to determine whether any improvements noted are observed both for students with disabilities and students without disabilities. Kentucky has found, for example, that while its students with disabilities consistently perform below other students, the gap between the two groups of students has decreased over time, at least in Grade 4, supposedly as a result of educational reforms implemented in the state (Trimble, 1998). Watching for these kinds of changes and for variations in change as a function of grade level, for instance—or extent of services received—will be important for Rhode Island, as it is for all states.

Data on the technical characteristics of the assessments when accommodations are used are perhaps less clear. In some specific cases, the factor structure of the tests appeared to be different

with different accommodations. There is need for further investigation here since small numbers of students were involved in some of the analyses. Internal consistency measures were generally quite high and comparable for accommodated and nonaccommodated conditions. Construct validity measures, similarly, were fairly good regardless of the use of accommodations.

Overall, Rhode Island's inclusive approach to assessment provides a model for other states to consider in their effort to develop or revise standards-based assessments. It provides a roadmap for building an accountability and assessment system that includes *all* students.

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